Early Results of a Highly Porous Titanium Cementless Tibial Baseplate in TKA
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Introduction
- The use of cementless TKAs has gained popularity due to the increased life expectancy in our patient population¹.
- Cementless TKAs have not been adopted as readily as THAs due to the challenges and uncertainty of tibial fixation and past failures².
- With the advent of new technologies, the results of cementless TKAs with the potential for long term biologic fixation may now be equivalent or better than cemented TKAs³,⁴.
- A novel highly porous tibial baseplate (Figure 1) was developed based on proximal tibial anatomy using CT scans using 3D printing technology with ideal length, location and design of press-fit pegs (Figure 2).
- The purpose of this study was to review the early results with respect to fixation and complications using a new cementless tibial baseplate.

Methods
- 100 primary cementless TKAs were retrospectively reviewed (Stryker, Triathlon Tritanium baseplate, Peri-apetite Femoral Component and Porous Backed Tritanium Patella)
- Patients were evaluated at 2 weeks, 3 months, 1 year, and 2 years for clinical and radiographic outcomes.
- Radiographs were evaluated using zonal analysis for biological fixation and radiolucent lines.
- Early (90 day and 2 year) complications were assessed.
- The same pain management and rehabilitation protocol was assigned for all patients. Immediate full weight-bearing, as tolerated, was prescribed post-operatively.

Table 1 – Demographic and Clinical Results

<table>
<thead>
<tr>
<th>Demographics</th>
<th>Age</th>
<th>BMI (mean)</th>
<th>Sex</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>63.8</td>
<td>33.7</td>
<td>68 Female / 32 Male</td>
</tr>
<tr>
<td>Knee Society Score</td>
<td>Pre-Op (mean)</td>
<td>40</td>
<td>Post-Op (mean)</td>
</tr>
<tr>
<td>Knee Society ROM (Flexion / Extension)</td>
<td>Pre-Op (mean)</td>
<td>105.8° / 1.9°</td>
<td>Post-Op (mean)</td>
</tr>
</tbody>
</table>

Results
- 86 unilateral and 7 bilateral cases were enrolled in this study. Demographics and outcome scores were collected (Table 1). Mean patient follow up was 24.8 months (range 15 to 33) and mean LOS 3.2 days.
- Radiographic Results – Good short term fixation was noted. (Figure 3-5). Tibial coverage was maximized for all cases (Figure 6).
- Within 90 Day Adverse Events –
  - No cases of loosening, infections, or postoperative transfusions
  - 1 DVT, 1 PE non fatal
  - 1 revision for instability – CR femur converted to PS, tibial baseplate not revised
- Latest Follow-Up Adverse Events –
  - No revision of the tibial baseplate or femoral components.
  - 2 cases had revision of the liner only:
    - Instability + extensor mechanism rupture: liner change + medial imbrication and lateral release (18 months post-op)
    - MPFL rupture with subluxating patella: liner exchange with quad tendon repair (8 months post-op)

Discussion & Conclusions
- Study results indicate cementless fixation using this baseplate is a viable option with good short term clinical results and no cases of asceptic loosening at 2 years.
- Early stability, pain relief and good ROM was shown.
- Long term data will be required to determine the overall benefits of this highly porous TKA with biologic fixation versus cemented arthroplasty.

References: